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10/733,401

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Mi-Sook Nam

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EXAMINER

SHERMAN, STEPHEN G

ART UNIT

PAPER NUMBER

2629

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DELIVERY MODE

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

### Application No.

10/733,401

### Applicant(s)

NAM ET AL.

### Examiner

Stephen G. Sherman

### Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 December 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-8,10,11,13-15 and 19-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-8,10,11,13-15 and 19-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

1. This office action is in response to the amendment filed 27 December 2007.

Claims 1-2, 4-8, 10-11, 13-15 and 19-23 are pending.

### *Response to Arguments*

2. Applicant's arguments filed 27 December 2007 have been fully considered but they are not persuasive.

The applicants argue beginning on page 6 that Ozawa, Ozawa et al. and Kubota fail to teach the claims as amended. Specifically, the applicant's state on page 6, paragraph 6 that Ozawa et al. and Ozawa fail to disclose that the backlight is a sequential backlight including red, green and blue lamps, and a backlight controller connected to the sequential backlight to control the timing of light emissions in the transmission mode. The applicant's then continues in paragraph 7 of page 6 stating that the reference used to teach this feature, Kubota, discloses that a light-emitting diode is disposed at the side of the array substrate, whereas the amended claim states that the backlight is disposed under the TFT array substrate. The applicant then states that "Ozawa et al., Ozawa and Kubota fail to teach or suggest that the backlight comprising is disposed under the TFT array substrate. The examiner respectfully disagrees.

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The examiner agrees that Ozawa et al. and Ozawa fail to disclose that the backlight is a sequential backlight including red, green and blue lamps, and a backlight controller connected to the sequential backlight to control the timing of light emissions in the transmission mode. The examiner also agrees that the light-emitting diode in Kubota is disposed at the side of the array substrate, however, the rejection is based upon the combination of references, and Ozawa et al. disclose a backlight being disposed under the TFT array substrate in Figure 6B, element 7 as explained in the rejection found below. Thus, in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1-2, 4-8, 10-11, 13-15 and 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ozawa et al. (US 2006/0152658) in view of Ozawa (US 7,092,062) and further in view of Kubota et al. (US 2002/0171792).

**Regarding claim 1**, Ozawa et al. disclose a trans-reflective liquid crystal display device comprising:

a plurality of data and gate lines defining a plurality of pixels (Figure 12 and paragraph [0160] explain that scanning lines 151 and data lines 152 have pixels 153 formed at their intersection.), the pixels having a reflection region and a transmission region (Figure 6B shows a pixel structure containing a reflection region and a transmission region.);

a timing controller that receives, converts, and outputs image data (Figure 21 and paragraphs [0193]-[0194] explain that timing generator 573 controls the display-data outputting source 570 and the display-data processing circuit 571 to output display data.);

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a gate driver that receives a gate signal from the timing controller (Figure 12 shows a scanning driver circuit 157 as explained in paragraphs [0160] and [0195].);

a data driver that receives a data signal from the timing controller (Figure 12 shows a data driver circuit 158 as explained in paragraphs [0160] and [0195].);

a liquid crystal display panel with a TFT array substrate and a color filter substrate, the liquid crystal display panel displaying the image according to a gate pulse and a data voltage applied by the gate driver and the data driver (Figure 13 and paragraphs [0160]-[0161] and [0169] explain that there is a TFT substrate and a substrate for the color filters, and also the scanning and data drivers driver the scanning and data lines, which would be done by gate pulses and data voltages.); and

a backlight (Paragraph [0072] and Figure 6B, element 7), wherein the backlight is disposed under the TFT array substrate (Figure 6B shows that the backlight 7 is disposed under the TFT array substrate.).

Ozawa et al. fail to explicitly teach of a switching unit that determines the output signal of the timing controller according to a transmission mode or reflection mode, wherein the backlight is turned on in a transmission mode to sequentially transmit the light into the transmission region and is turned off in a reflection mode.

Ozawa discloses that in a display utilizing a reflective and transmissive mode in which the modes are switched based upon the detection of the ambient light (Column 1, lines 18-35.), wherein the backlight is turned on in a transmission mode to sequentially transmit the light into the transmission region and is turned off in a reflection mode

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(Column 1, lines 18-35, the examiner understands that when in the reflection mode the backlight would be turned off since power savings is achieved.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the switching mode taught by Ozawa with the trans-reflective liquid crystal device taught by Ozawa et al. in order to present a distinct display under dark conditions while saving power.

Ozawa et al. and Ozawa fail to disclose that the backlight is a sequential backlight including red, green, and blue lamps, and a backlight controller connected to the sequential backlight to control the timing of light emissions in the transmission mode.

Kubota et al. disclose a trans-reflective liquid crystal display device comprising a sequential backlight including red, green, and blue lamps (Paragraph [0089]), wherein the backlight is turned on in a transmission mode to sequentially transmit light into the transmission region (Paragraph [0089] explains that red, green and blue light is sequentially applied in the transmission mode.) and is turned off in a reflection mode (Paragraph [0088] explains that the display is driven in the reflective mode in the same manner as prior art reflective liquid crystal display panels, meaning that the backlight is turned off during reflective mode. See paragraph [0005].); and

a backlight controller connected to the sequential backlight to control the timing of light emission in the transmission mode (Paragraph [0089] explains the timing is controlled to switch the three colors every 8 ms, which means that there is inherently a controller to control the timing.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use a sequential backlight as taught by Kubota et al. with the trans-reflective display taught by the combination of Ozawa et al. and Ozawa in order to obtain a liquid crystal display device capable of displaying excellent images with low power consumption, regardless of the brightness of the surrounding environments (See Kubota et al., paragraph [0029]).

**Regarding claim 2**, Ozawa et al., Ozawa and Kubota et al. disclose the trans-reflective liquid crystal display device of claim 1.

Kubota et al. also disclose wherein the color filter substrate includes a color filter formed in the reflection region (Paragraphs [0028]-[0029]).

**Regarding claim 4**, Ozawa et al., Ozawa and Kubota et al. disclose the trans-reflective liquid crystal display device of claim 1.

Although Ozawa et al., Ozawa and Kubota et al. fail to explicitly teach wherein the data driver includes a MUX circuit shorting three adjacent data lines, the MUX circuit being turned on in the transmission mode and turned off in the reflection mode, the examiner interprets that given the combination of references, that when the backlight is on that the same display data will be transmitted to three adjacent data line (red, green and blue), as explained in Kubota et al. paragraph [0089] which states that red, green and blue will be emitted from the backlight and thus the same signal will be applied to the data lines, and that when the backlight is OFF that the display data applied to the



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pixels will all be different since the reflection through the color filter will create the color of the display.

**Regarding claim 5**, Ozawa et al., Ozawa and Kubota et al. disclose the trans-reflective liquid crystal display device of claim 1.

Kubota et al. also disclose wherein the lamp backlight includes a light emitting diode (Paragraph [0089]).

**Regarding claim 6**, Ozawa et al., Ozawa and Kubota et al. disclose the trans-reflective liquid crystal display device of claim 1.

Ozawa et al. also disclose wherein the cell gap between in the transmission region is twice that in the reflection region (Figure 6B shows that the cell gap in the transmission region, represented by  $d$ , can be seen to be twice the size of the gap in the reflection region.).

**Regarding claim 7**, Ozawa et al., Ozawa and Kubota et al. disclose the trans-reflective liquid crystal display device of claim 1.

Kubota et al. also disclose wherein the timing controller divides one frame of display data into three sub-frames (Paragraph [0089] explains that the backlight is switched every 8 mms dependent upon red, green and blue, meaning that there will be three sub-frames, one for each color.).

**Regarding claim 8**, this claim is rejected under the same rationale as claim 1.

**Regarding claim 10**, please refer to the rejection of claim 4.

**Regarding claim 11**, please refer to the rejection of claims 1 and 2, and furthermore Ozawa et al. also disclose a reflective electrode in the reflection region to reflect light incident from outside the liquid crystal panel (Figure 6B shows the reflecting electrode 4 as explained in paragraph [0118].).

**Regarding claim 13**, Ozawa et al., Ozawa and Kubota et al. disclose the liquid crystal display device of claim 11.

Ozawa et al. also disclose wherein the liquid crystal panel includes:

a second substrate (Figure 6B shows substrate 20.); and

a liquid crystal layer between the first and second substrate (Figure 6B shows a liquid crystal layer 50.).

**Regarding claim 14**, Ozawa et al., Ozawa and Kubota et al. disclose the liquid crystal display device of claim 11.

Ozawa et al. also disclose wherein the switching device includes a thin film transistor (Figure 18).

**Regarding claim 15**, this claim is rejected under the same rationale as claim 6.

**Regarding claim 19**, please refer to the rejection of claim 1.

**Regarding claim 20**, this claim is rejected under the same rationale as claim 4.

**Regarding claim 21**, Ozawa et al., Ozawa and Kubota et al. disclose the trans-reflective liquid crystal display of claim 1.

Kubota et al. also disclose wherein the light from the backlight passes through the color filter substrate unfiltered (Paragraphs [0028]-[0029]).

**Regarding claim 22**, Ozawa et al., Ozawa and Kubota et al. disclose the method of claim 8.

Kubota et al. also disclose wherein the light from the backlight does not pass through a color layer (Paragraphs [0028]-[0029]).

**Regarding claim 23**, Ozawa et al., Ozawa and Kubota et al. disclose the liquid crystal display device of claim 11.

Kubota et al. also disclose wherein the color layer is only in the reflective region (Paragraphs [0028]-[0029]).

### **Conclusion**

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6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen G. Sherman whose telephone number is (571) 272-2941. The examiner can normally be reached on M-F, 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SS

19 February 2008

AMR A. AWAD  
SUPERVISORY PATENT EXAMINER

A handwritten signature in black ink, appearing to read "Amr A. Awad", is written over the printed name and title.